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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/823,263	03/30/2001	Russel H. Marvin	PLUG-0037-US(499)	7257

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EXAMINER

WILLS, MONIQUE M

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 12/03/2003

5

Please find below and/or attached an Office communication concerning this application or proceeding.

2105

<b>Office Action Summary</b>	<b>Application No.</b> 09/823,263	<b>Applicant(s)</b> MARVIN ET AL.	
	<b>Examiner</b> Wills M Monique	<b>Art Unit</b> 1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 March 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☒ Claim(s) 16-18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input checked="" type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____    | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Claim Objections***

Claims 18 & 19 are objected to because of the following informalities: the claims are numbered out of sequence. Appropriate correction is required.

When claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented.

Misnumbered claim 18 has been renumbered 17.

Misnumbered claim 19 has been renumbered 18.

### ***Allowable Subject Matter***

Claims 16-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The instant claims are allowable over the prior art of record, because the prior art is silent to a fuel cell system comprising a fuel cell subsystem connected to a load through a diode, a supplemental power subsystem connected to a load through a diode, wherein the subsystem furnishes power to the load when the lowest cell voltage drops below  $-0.35$  volts (claim 16), more than  $-0.4$  volts (claim 17) and more than  $-0.5$  volts (claim 19).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5 & 7-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Lacy et al. U.S. Patent 6,428,917 in view of Gartstein et al. U.S. Pub. 2002/0001745 as evidentiary support.

The applied reference has a common assignment with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Lacy teaches a fuel cell system comprising a fuel cell stack 32 that consumes reactants (hydrogen and air) and produces electricity to a load, and a fuel processor 47 to produce hydrogen flow (col. 2, lines 30-35, claim 3). A controller monitors the output power of the fuel cell and controls a reformer to regulate the hydrogen flow based on monitored power (col. 2, lines 40-45, claim 4). The controller places a maximum limit on

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the cell current to keep the minimum cell voltage from decreasing below the threshold voltage and the controller may set a maximum current limit (col. 3, lines 1-10). Said current limiting is achieved through a DC/Dc converter (col. 3, lines 35-45), which inherently is a type of voltage regulator (See Garstein paragraph 5), meeting claims 7 & 13. The subsystem also comprises a battery 30, and a first circuit that electrically connects the battery to the load when the fuel cell delays based on the fuel cell stack voltage, and electrically disconnects the battery from the load when the fuel cell subsystem responds to the change in power (col. 3, lines 30-55, meeting claims 2,5,9,11 & 12). The controller 10 includes a current sensor to indicate current through the fuel cell stack (col. 4, lines 30-31). A second circuit comprising a voltage monitoring circuit that determines the minimum cell voltage and monitors the cell voltages of the fuel cell, said circuit also includes a controller that prevents the current from exceeding a maximum threshold current based on the minimum cell voltage (col. 4, lines 10-38 & col. 3, lines 10-20, claim 1). With regards to claims 8 & 10, the reference teaches using the fuel cell stack to furnish power to a load (col. 2, lines 35-45), connecting a battery to the load in response to the fuel cell when said fuel cell delays when responding to power (col. 3, lines 50-60), monitoring a current through the fuel cell (col. 4, lines 25-35), monitoring cell voltages of the stack (col. 4, lines 15-30), determining the minimum cell voltage (col. 4, lines 15-30), preventing the current from exceeding a maximum threshold current based on the minimum cell voltage (col. 3, lines 5-20), monitoring power (col. 2, lines 30-50), producing hydrogen (col. 2, lines 40-55), regulating a rate of

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production in response to the monitoring (col. 2, lines 40-60), providing the hydrogen to the stack (col. 2, lines 40-60). Therefore, the instant claims are anticipated by Lacy.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 14-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Jones et al. U.S. Patent 6,581,015

The applied reference has a common assignment with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Jones teaches a fuel cell subsystem including a voltage monitoring circuit to measure the cell voltage and  $V_{\text{TERM}}$  or lowest cell voltage (col. 5, lines 1-10), furnish

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power to a load (col. 3, lines 10-20). The subsystem including voltage monitoring circuit 40 and fuel cell stack 20 are connected to load 50 through a diode 11 (Fig. 1). A fuel process furnishes reformat to the fuel cell (col. 3, lines 10-25), a battery or supplemental power subsystem furnishes power to the load when the lowest cell voltage drops below a predefined threshold, the battery is connected to load 50 through diode 43 (col. 10, lines 10-26), the controller 60 monitors the power and regulates the rate at which the fuel processor produces hydrogen to the load (col. 5, lines 25-40). Therefore, the instant claims are anticipated by Jones.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lacy et al. U.S. Patent 6,428,917 as applied to claim 1 above, and further in view of Takabayashi U.S. Patent 4,741,978.

Lacy teaches a fuel cell system described hereinabove, when the battery is coupled to the fuel cell subsystem when the voltage of the stack near a voltage

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threshold of the fuel cell, because the controller sets the maximum current limit near the current level at the voltage threshold (col. 3, lines 15-20 and lines 50-55).

The reference is silent to the battery being couple to the fuel cell subsystem with a diode.

The prior art such as Takabayshi, teaches it is conventional to employ a diode to connect batteries in fuel cell systems in order to prevent current from reversing to the fuel cell (col. 3, lines 1-5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the diode of Takabayshi in the system of Lacy in order to prevent current from reversing back into the fuel cell. The skilled artisan recognizes that if the current flow reverses back into the fuel cell, the current could overload the fuel cell causing irreparable electrical damage.

### ***Conclusions***

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Monique Wills whose telephone number is (703) 305-0073. The Examiner can normally be reached on Monday-Friday from 8:30am to 5:00 pm.



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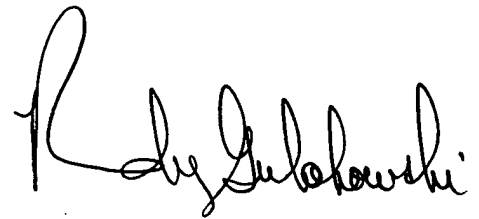
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

If attempts to reach Examiner by telephone are unsuccessful, the Examiner's supervisor, Randy Gulakowski, may be reached at 703-308-4333.

The unofficial fax number is (703) 305-3599. The Official fax number for non-final amendments is 703-872-9310. The Official fax number for after final amendments is 703-872-9311.

Mw

11/16/03

A handwritten signature in black ink, appearing to read "Randy Gulakowski". The signature is stylized with a large initial "R" and a cursive script for the rest of the name.

RANDY GULAKOWSKI  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700